

What is claimed is:

1. An image reading apparatus comprising:

an original tray for placing an original;

5 a transport path for guiding the original from the original tray to a reading position;

transport means for transporting the original at the reading position toward a downstream side of the reading position in a forward direction, or toward an upstream side of the reading position in a reverse direction;

10 reading means for reading the original at the reading position;

determination means electrically connected to the reading means for determining whether the original read by the reading means has a black and white image or color image; and

15 a retreat path disposed at the upstream side of the reading position for retreating at least a part of the original from the transport path so that the original read by the reading means and determined by the determination means is transported in the reverse direction relative to the reading position, and the  
20 reading means reads the original for a second time in a reading mode according to a result of the determination means after the at least part of the original retreats to the retreat path.

2. An original reading apparatus according to claim 1, wherein  
25 said transport means has a first transport speed for determining the original by the determination means, a second speed for transporting the original determined by the determination means in the reverse direction at the reading position, and a third speed for reading the original determined by the determination  
30 means for the second time.

3. An image reading apparatus according to claim 2, wherein said first transport speed is set to be greater than the third transport speed, and less than the second transport speed.

5

4. An image reading apparatus according to claim 1, wherein said reading means stops reading the original and said transport means transports the original in the reverse direction when the determining means determines that the original has the color  
10 image.

5. An image reading apparatus according to claim 1, further comprising detection means for detecting whether the original has a length long enough to retreat to the retreat path, said  
15 transport means switching a direction that the original is transported at a timing according to a position of a trailing edge of the original when the determining means determines that the original has the color image.

20 6. An image reading method comprising the steps of:

feeding an original on an original tray and transporting the original to a reading position;

reading the original at the reading position;

determining whether the read original has a black and white  
25 image or color image;

transporting the determined original in a reverse direction toward an upstream side relative to the reading position;

transporting the original again toward the reading position;  
and

reading the original supplied again to the reading position in a reading mode according to a result of the determination.

7. An image reading method according to claim 6, further comprising the step of checking whether a trailing edge of the original is located at a position to be transported in the reverse direction before the step of transporting the original in the reverse direction.

10 8. An image reading apparatus comprising:

a transport path disposed between an original tray and a reading position;

transport means for transporting an original at the reading position toward a downstream side of the reading position in a forward direction or toward an upstream side of the reading position in a reverse direction;

reading means for reading the original at the reading position;

determination means electrically connected to the reading means for determining whether the original has a black and white image or color image;

detection means for detecting whether a trailing edge of the original passes through the reading position; and

transport switching means for switching the transport means to move the original from the forward direction to the reverse direction to return the original toward the original tray when the detection means detects that the trailing edge of the original passes through the reading position, and again to move the original to the forward direction so that the reading means

reads the original for a second time in a reading mode according to a result of the determining means.

9. An image reading apparatus according to claim 8, further  
5 comprising a retreat path extending from the transport path for retreating the original when the original is transported in the reverse direction.

10. An image reading apparatus according to claim 8, wherein in  
10 moving the original in the reverse direction, said transport means transports the original until a leading edge of the original passes through the reading position.

11. An image reading method comprising the steps of:  
15 transporting an original on an original tray to a reading position;

reading an image on the original passing through the reading position;

determining whether the original has a black and white image  
20 or color image;

transporting the original toward the original tray in a reverse direction after a trailing edge thereof passes through the reading position;

transporting the original toward a downstream side of the  
25 reading position after a leading edge of the original passes the reading position so that the original passes through the reading position again; and

reading the original for a second time in a reading mode according a result of the determination means while the original  
30 passes through the reading position.

12. An image reading apparatus comprising:

a transport path disposed between an original tray and a reading position;

5 transport means for transporting an original at the reading position toward a downstream side of the reading position in a forward direction, or toward an upstream side of the reading position in a reverse direction;

reading means for reading the original at the reading  
10 position;

determination means electrically connected to the reading means for determining whether the original has a black and white image or color image;

circulating path disposed at a downstream side of the  
15 reading position for returning the original again to the reading position after the original passes through the reading position;

detection means for detecting a trailing edge of the original; and

judging means electrically connected to the detection means  
20 for judging a transfer direction of the original based on a position of the trailing edge of the original when the determining means determines that the original has the color image, said judging means transporting the original by the transport means to the reading position in the forward direction  
25 after transporting the original in the reverse direction, or by returning the original again to the reading position through the circulating path after the original passes through the reading position, said reading means reading the original for a second time in a reading mode according to a result of the determination  
30 means.

13. An image reading apparatus according to claim 12, wherein  
said circulating path is a switchback path for turning over the  
original from a front to a back and switching a leading edge and  
5 the trailing edge of the original.

14. An image reading apparatus according to claim 13, wherein  
said reading means reads the original transported via the  
circulating path after the original is circulated twice through  
10 the circulating path.

15. An image reading apparatus according to claim 12, further  
comprising a retreating path extending from the transport path so  
that when the transport means transports the original in the  
15 reverse direction, at least a part of the original retreats into  
the retreating path.

16. An image reading method comprising the steps of:  
transporting an original on an original tray to a reading  
20 position;

reading an image on the original passing through the reading  
position;

determining whether the original has a black and white image  
or color image;

25 detecting a trailing edge of the original;

judging a transport direction of the original according to a  
position of the trailing edge of the original when the  
determining means determines that the original has the color  
image, said judging means judging to transport the original again  
30 to the reading position in a forward direction after transporting

the original in a reverse direction, or to transport the original again to the reading position through a circulating path after the original passes through the reading position;

supplying the original to the reading position again  
5 according to the judgment of the transport direction; and

reading the original for a second time in a reading mode according to a result of the determination.